

Fig. 1

28

00321T" 2242260

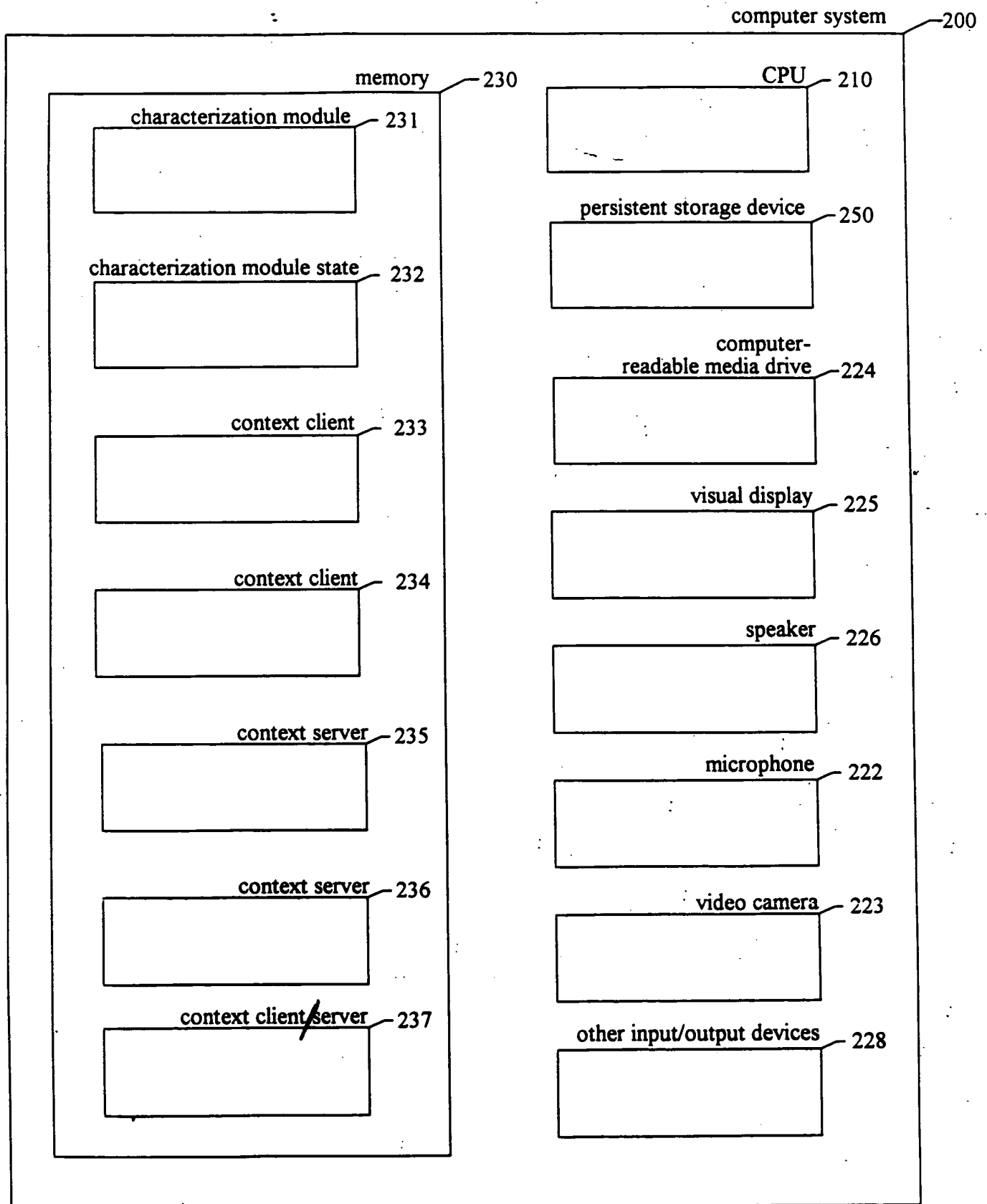


Fig. 2

310 320

CONTEXT
SERVER
(GPS)

CONTEXT
SERVER
(CIPS)

311
user
location
attribute

321
user
location
attribute

322
user
elevation
attribute

331
user
in-region
attribute

300
CHARACTERIZATION MODULE

330
CONTEXT
CLIENT
SERVER

341
user
location
attribute

351
user
in-region
attribute

352
user
elevation
attribute

332
user
location
attribute

340
CONTEXT
CLIENT
(distance-
from-home)

CONTEXT
CLIENT
(location-
map)

FIG-3

OBJECT "CONTEXT"

context server table

context server name	version	installation date	filename	request handler
gps	1	2/10/2000	gps.exe	(reference)
ips	1	2/21/2000	ips.exe	(reference)
location region analysis	1	2/10/2000	lra.exe	(reference)

FIG 4

attribute instance table

attribute name	context server name	value	uncertainty	timestamp	units	number of context clients consuming
user.location	gps	47° 38.73' N, 122° 18.43' W	0° 09'	13:11:04.023 2/22/2000	degrees/minutes	2
user.location	ips	47° 38.745' N, 122° 18.424' W	0° 021'	13:11:01.118 2/22/2000	degrees/minutes	2
user.elevation	ips	22	.5	13:11:01.118 2/22/2000	meters	1
user.in_region	location_region_analysis	none	none	none	none	0

FIG 5

SECRET 2242260

600

context client table

context client name	message handler
location map	(reference)
distance from home	(reference)
region analysis	(reference)

FIG 6

611

612

attribute instance table

attribute name	context server name	value	uncertainty	timestamp	units	number of context clients consuming
user.location	gps	47° 38.73' N, 122° 18.43' W	0° 09'	13:11:04.023 2/22/2000	degrees/minutes	2
user.location	ips	47° 38.745' N, 122° 18.424' W	0° 021'	13:11:01.118 2/22/2000	degrees/minutes	2
user.elevation	ips	22	.5	13:11:01.118 2/22/2000	meters	1
user.in_region	location_region_analysis	none	none	none	none	1

701 702 703 704

711 712 713 714 715 716 717

FIG 7

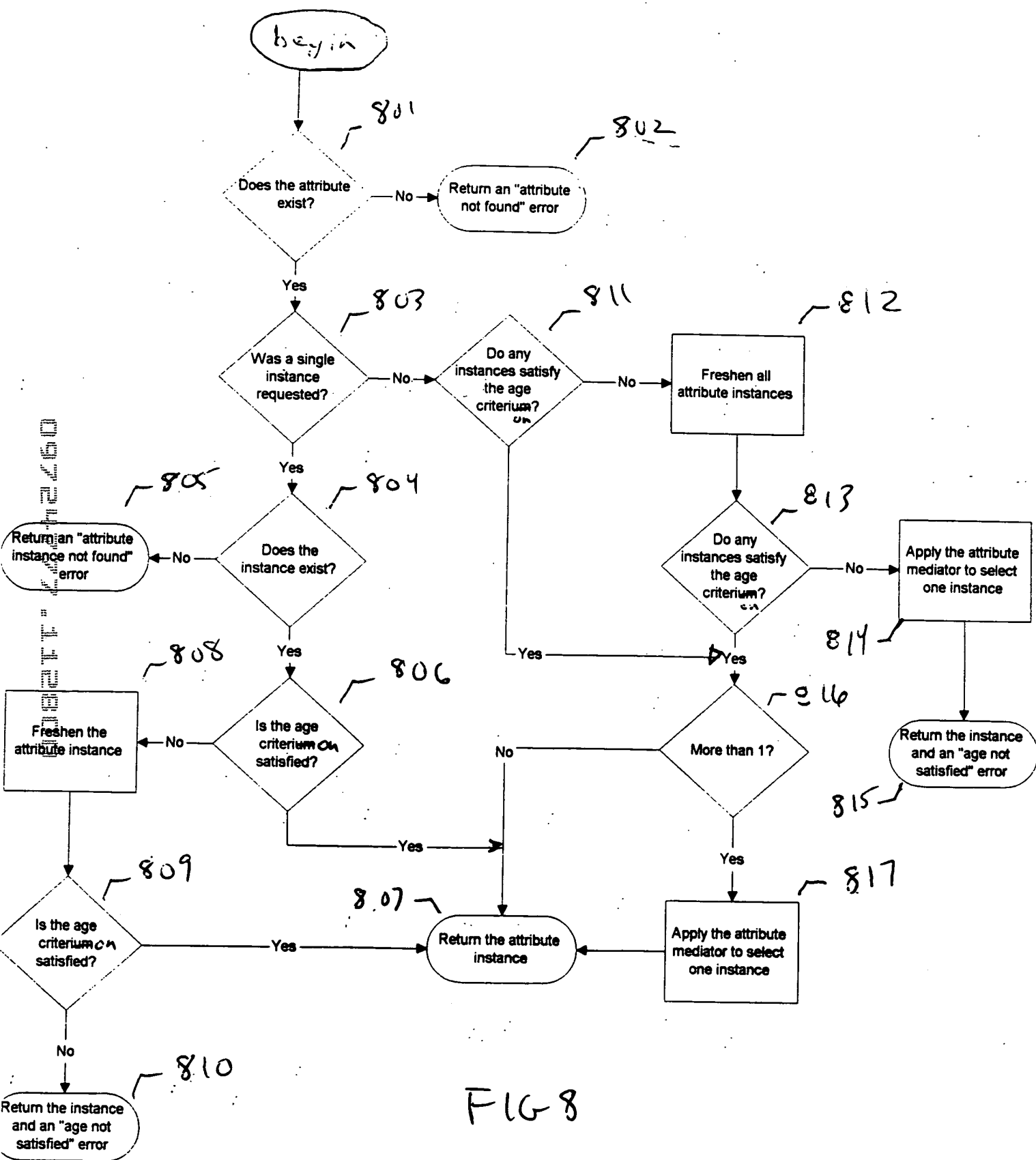


FIG 8

OBJECT "L242250"

attribute instance table

attribute name	context server name	value	uncertainty	timestamp	units	number of context clients consuming
user.location	gps	47° 38.73' N, 122° 18.43' W	0° .09'	13:11:04.023 2/22/2000	degrees/minutes	2
user.location	ips	47° 38.745' N, 122° 18.424' W	0° .021'	13:11:01.118 2/22/2000	degrees/minutes	2
user.elevation	ips	22.25	.5	13:11:06.565 2/22/2000	meters	1
user.in_region	region analysis	none	none	none	none	1

FIG 9

condition table

condition name	context client name	first logical parameter	second logical parameter	comparison value	logical operator
in_region_true	region analysis	user.in_region	none	TRUE	=

FIG 10

OBJECT "242250"

condition monitor table

condition monitor name	context client name	condition name	behavior	frequency	condition last evaluated	trigger handler reference	stopped
region_boundaries_crossed	region_analysis	in_region_true	TRUE or FALSE	30	13:11:29.101 2/22/2000	(reference)	no

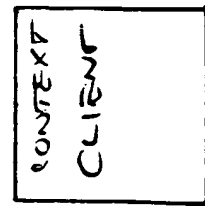
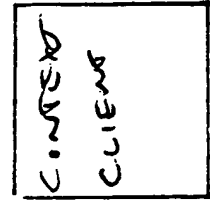
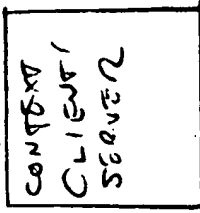
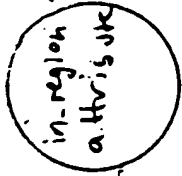
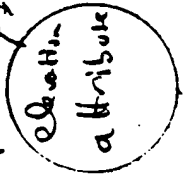
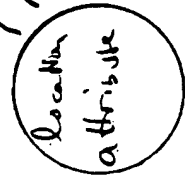
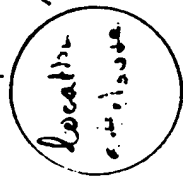
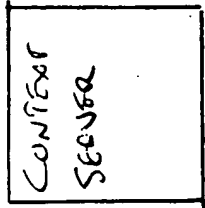
FIG 11

condition monitor table

condition monitor name	context client name	condition name	behavior	frequency	condition last evaluated	trigger handler reference	stopped
region_boundaries_crossed	region_analysis	in_region_true	TRUE or FALSE	30	13:11:59.101 2/22/2000	(reference)	yes

FIG 12

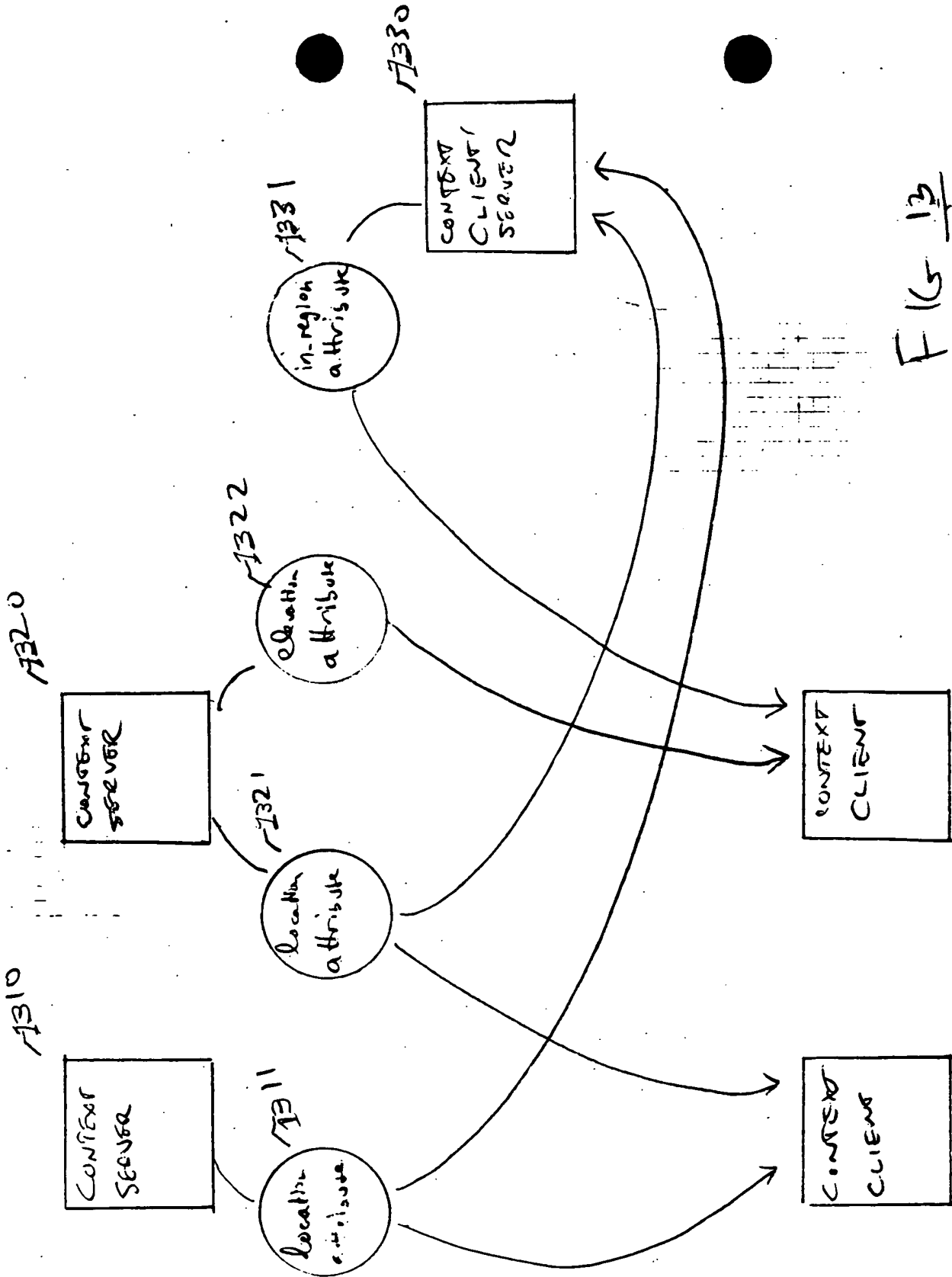
1310 1320



1340

1350

FIG 13



1401 ~
1402 ~
1403 ~
1404 ~

attribute name	context client name
user.location	distance_from_home
user.in_region	location_map
user.location [gps]	location_region_analysis
user.elevation	location_map

L 1411

2 1412

THE FUTURE OF THE FUTURE

- 1) User Setting
 - a) Mental Context
 - i) Meaning
 - ii) Cognition
 - (1) Divided User Attention
 - (2) Task Switching
 - (3) Background Awareness
 - iii) Solitude
 - iv) Privacy
 - (1) Desired Privacy
 - (2) Perceived Privacy
 - v) Social Context
 - vi) Affect
 - b) Physical Situation
 - i) Body
 - (1) Biometrics
 - (2) Posture
 - (3) Motion
 - (4) Physical Encumberment
 - (a) Senses
 - (i) Eyes
 - (ii) Ears
 - (iii) Tactile
 - (iv) Hands
 - (v) Nose
 - (vi) Tongue
 - (b) Workload demands/effects
 - (c) Interaction with computer devices
 - (d) Interaction with people
 - (e) Physical Health
 - ii) Environment
 - (1) Time/Space
 - (2) Objects
 - (3) Persons
 - (a) Audience/Privacy Availability
 - (i) Scope of Disclosure
 - (ii) Hardware affinity for privacy
 - (iii) Privacy Indicator for User
 - (iv) Privacy Indicator for Public
 - (v) Watching Indicator
 - (vi) Being Observed Indicator
 - (4) Ambient Interference
 - (a) Visual
 - (b) Audio
 - (c) Tactile
- 2) Computer
 - a) Power
 - b) Configuration
 - i) User Input Systems
 - (1) Hand/Haptic
 - (a) Keyboard/Keystrokes
 - (2) Voice/Audio
 - (3) Eye Tracking
 - (4) Cursors
 - (a) Axis
 - (b) Resolution
 - (i) Selection
 - (ii) Invocation
 - (c) Accelerators
 - ii) Output Systems
 - (1) Visual
 - (a) Resolution
 - (2) Audio
 - (a) Public/Private
 - (3) Haptic
 - iii) External Resources
 - (1) I/O devices
 - (2) Connectivity
 - c) Data
 - i) Quantity/State
 - ii) Urgency/Importance
 - (1) Use of Prominence
 - iii) Modality
 - iv) Sensitivity/Purpose
 - (1) Privacy Issues
 - (2) Use of Association
 - (3) Use of Safety
 - v) Source/Ownership
 - (1) Types
 - (a) User generated
 - (b) Other computers or people
 - (c) Sensor
 - (d) PC State
 - (2) Use of Association

Fig. 16

Fig. 17

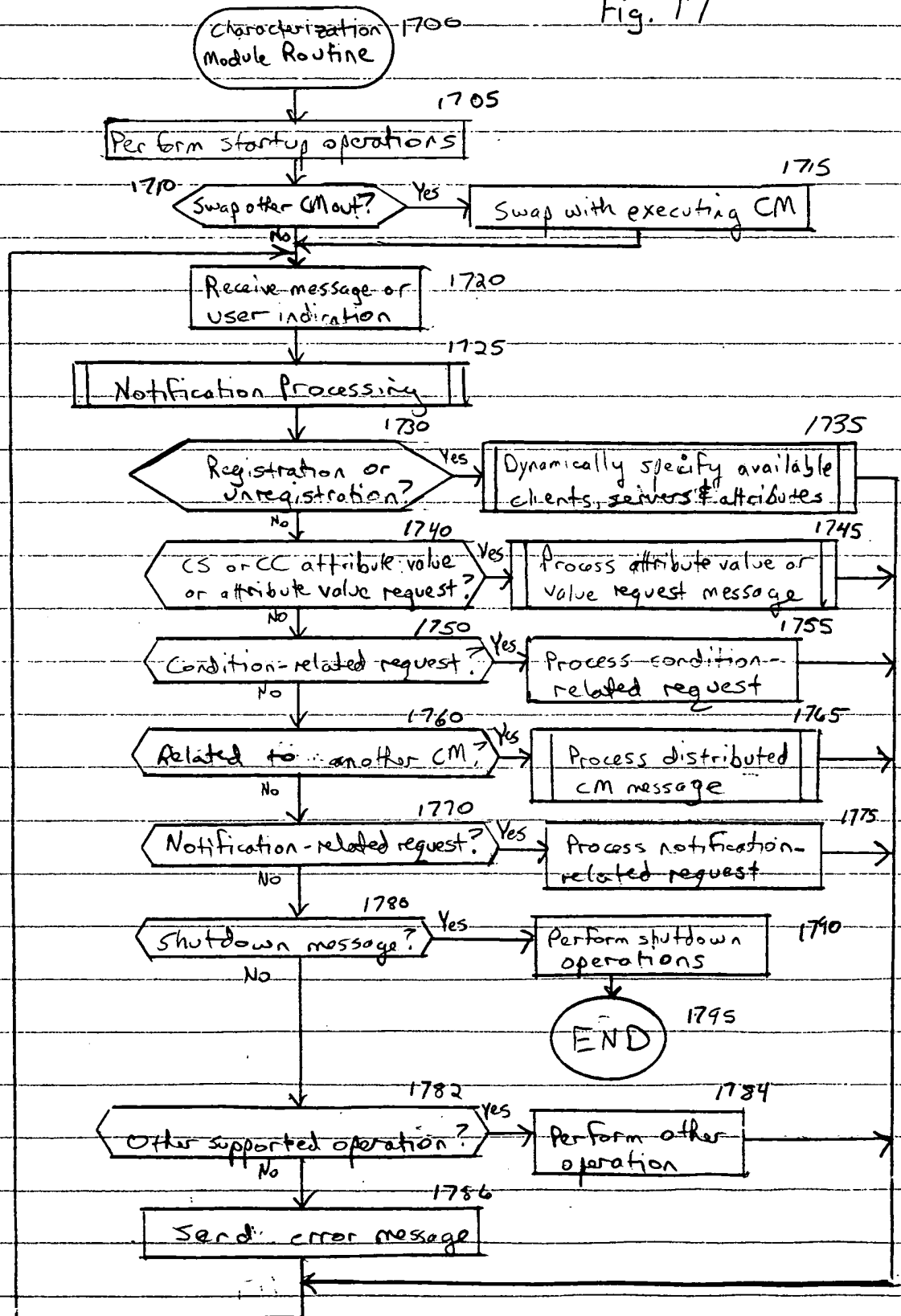


Fig. 18

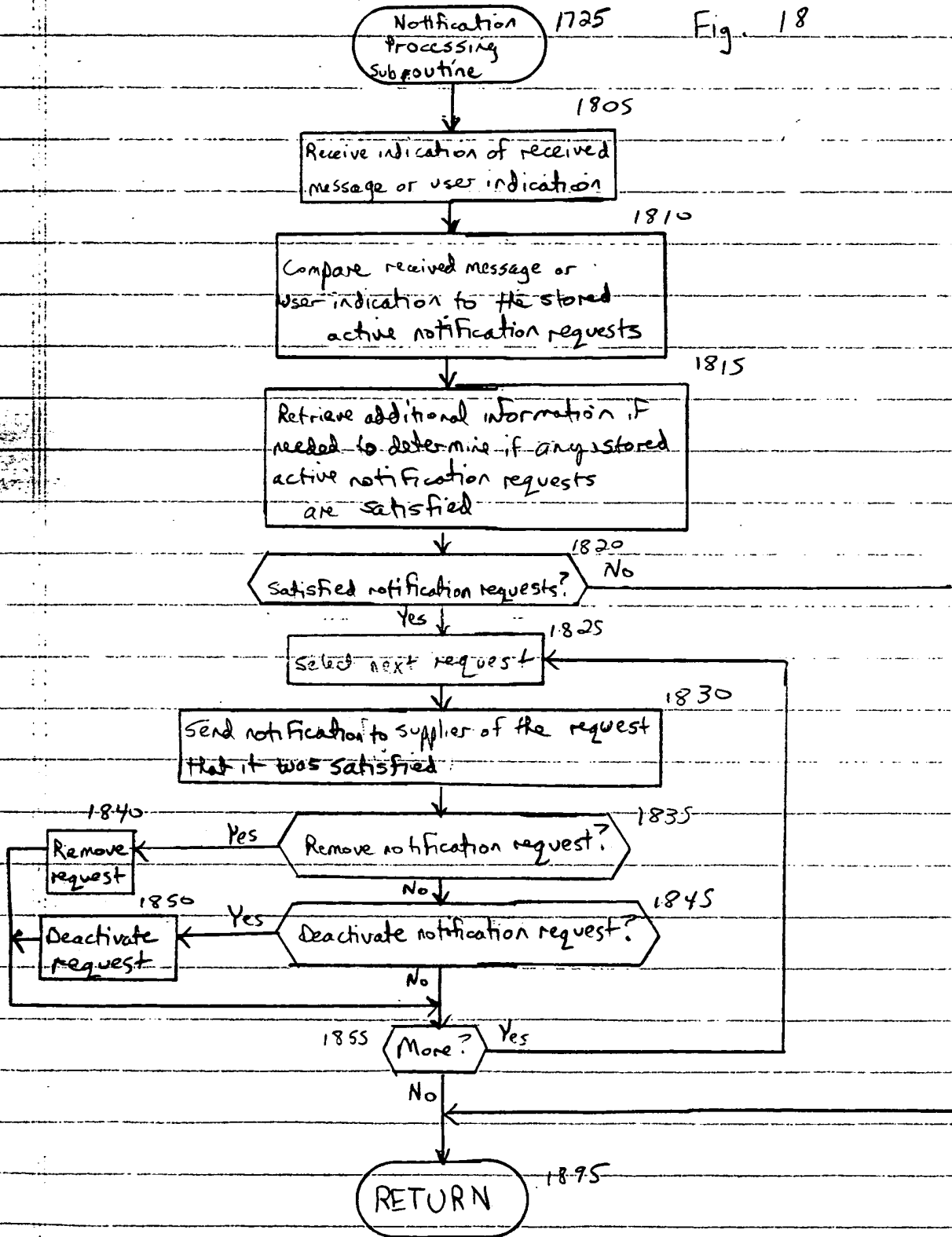


Fig. 19

Dynamically Specify Available
Clients, Servers, & Attributes
Subroutine

1735

Receive a registration or
unregistration message

1905

Need security approval?

Yes

No

Determine if security
is satisfied

1915

satisfied?

Yes

No

Send
error
message

1925

client

Related to ?
attributes

server

1940

Register?

Yes

No

Register new
client if
possible

1942

Error?

Yes

No

Send error
message

1944

Attributes
included to
register?

Yes

No

Unregister
client

1950

Unregister?

Yes

No

Any currently
registered attributes
for the client?

Yes

No

Register?

Yes

No

1980

1982

Select next
attribute

1984

Attribute exists?

Yes

No

Register new
attribute
instance

1986

1988

Register new
attribute

1990

More?

Yes

No

Unregister?

Yes

No

Unregister each
attribute

1994

1960

Register?

Yes

No

Register new
server if
possible

1962

1966

Attributes
included
to register?

Yes

No

Error?

Yes

No

Send error
message

1964

1968

Unregister?

Yes

No

Unregister
Server

1970

1972

Any currently
registered attributes
for the server?

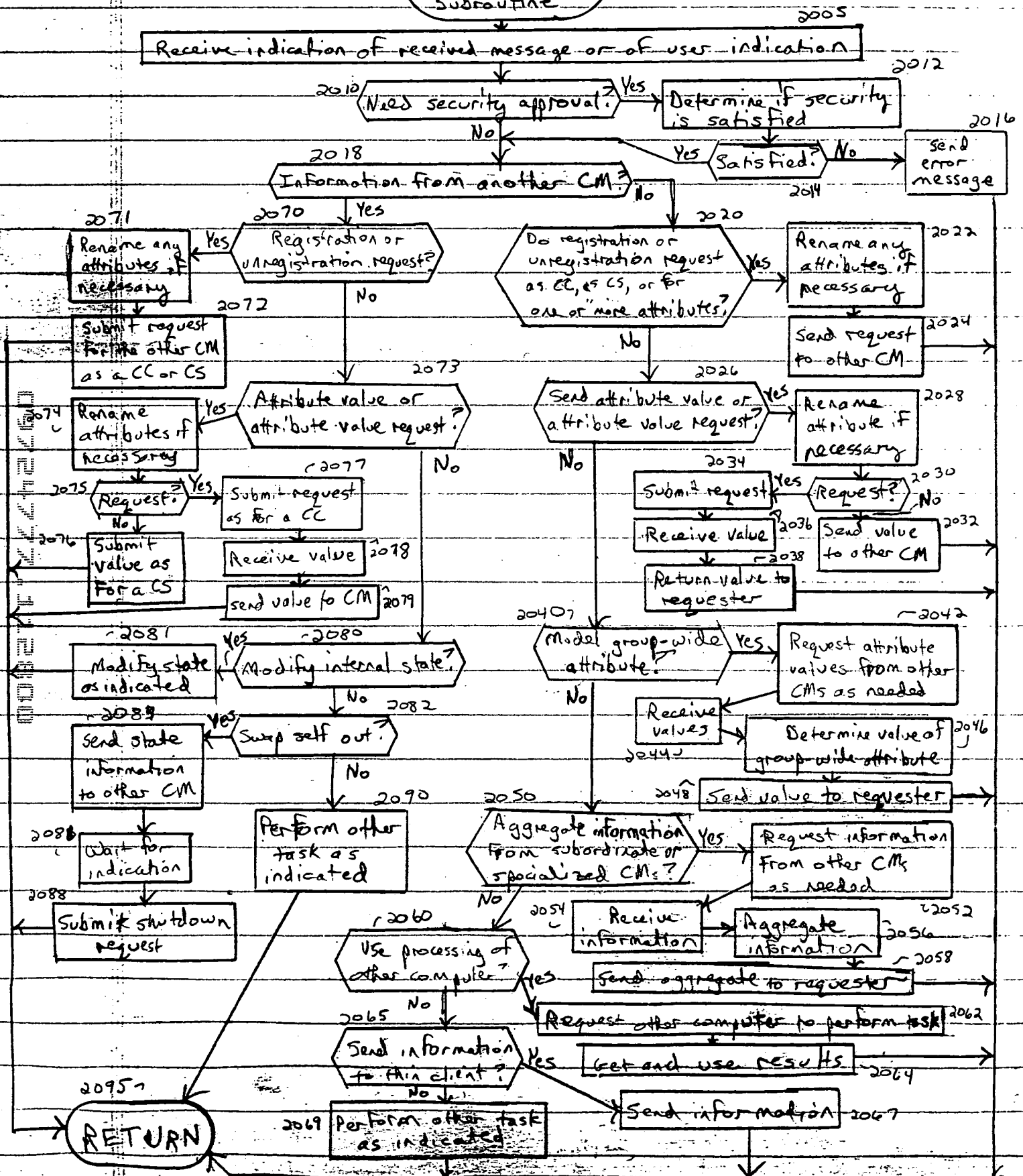
Yes

No

RETURN

1995

Process Distributed
CM Message
Subroutine



Process Attribute Value
On Value Request Message
Subroutine

1745

Fig. 21

2105

Receive indication of received
attribute value or value request

Request Value or request? Value

2150 Identify all attribute
instances matching
the request

2154

Send
error
message

Any instances?

No

Yes

Select next instance

Need new value?

No

2160 Pull attribute value
from server

2162 Receive value?

No

2164 Process received
attribute value

2166 More?

Yes

2168 Multiple values
available?

No

2170

Mediate available
values

2172 Send mediated value and
additional information
to requester

2174 Single value
available?

No

2176

Send value and
additional
information
to requester

2178 Send error
message

RETURN

2195

2120 Process received
attribute value

2122 Identify all attribute
value requests that
match the value

2124 Any requests?

No

2132 Mediate available
values

2134 Select mediated value

2136 Select received value

2138 Select next request

2140 Push selected attribute
value to client

2142 More?

Yes

2144

2146

2148

2150

2152

2154

2156

2158

2160

2162

2164

2166

2168

2170

2172

2174

2176

2178

2180

2182

2184

2186

2188

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2198

2200

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2222

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2244

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2630

Process Received
Attribute Value
subroutine

2200 Fig 22

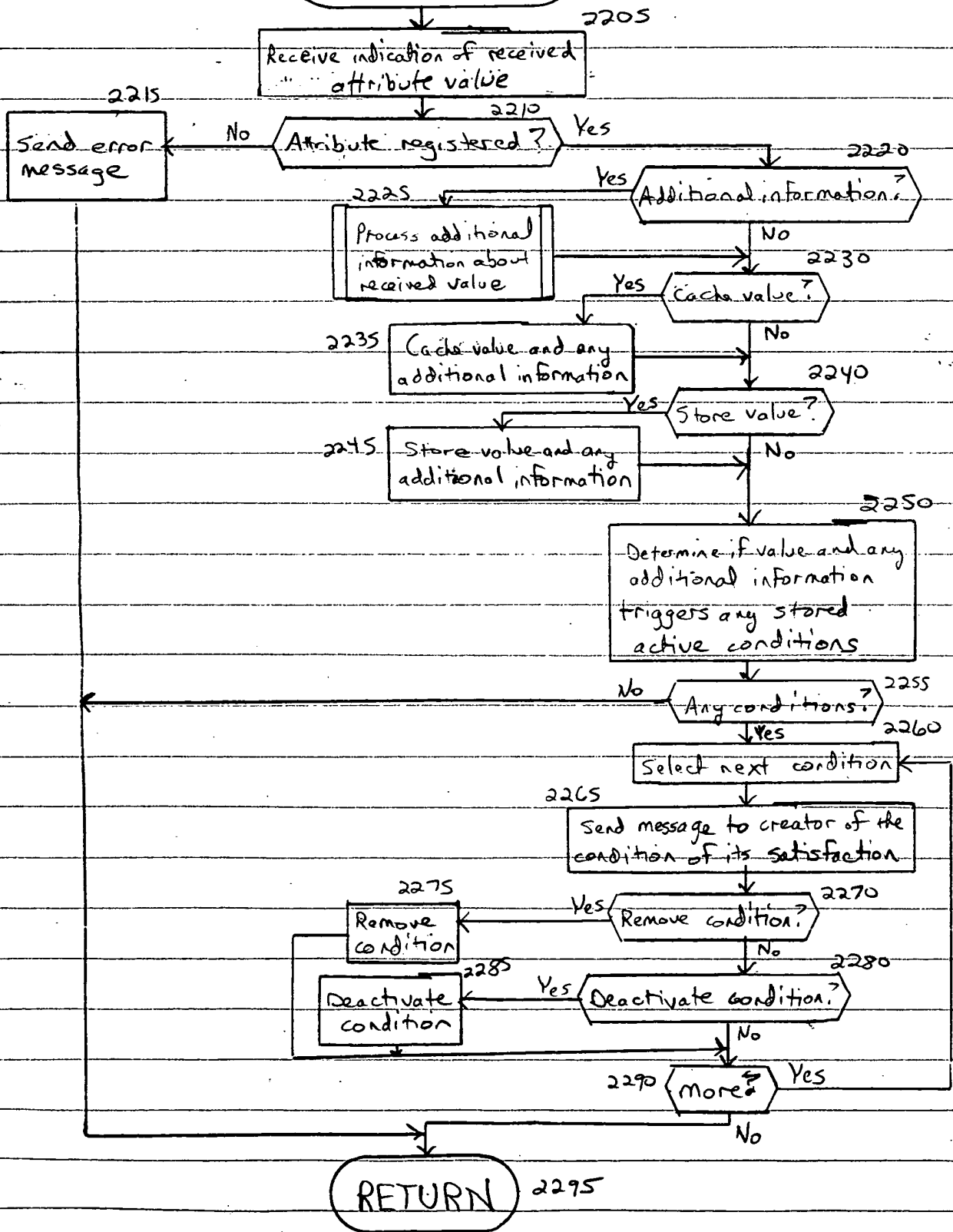


Fig. 23

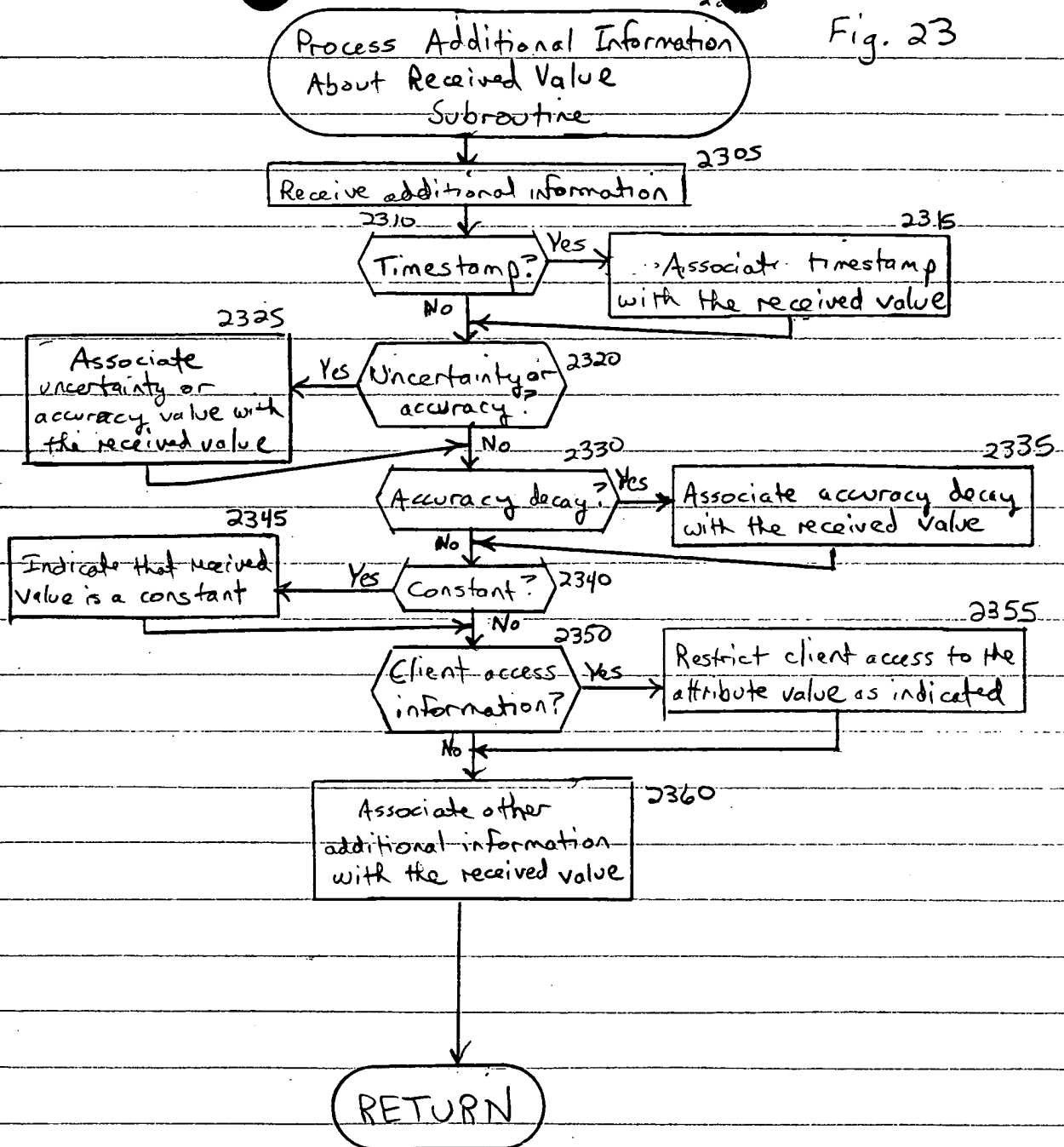
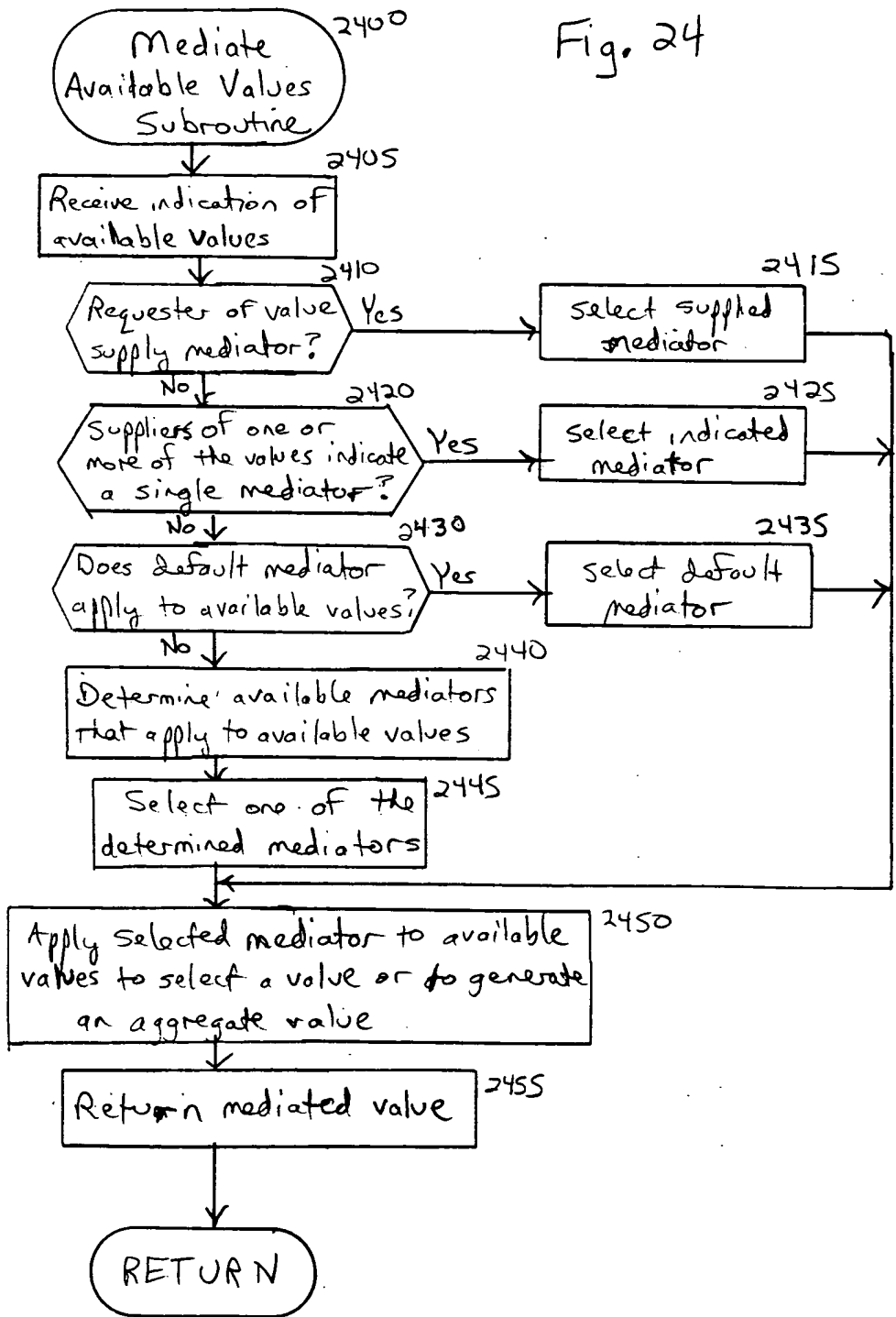
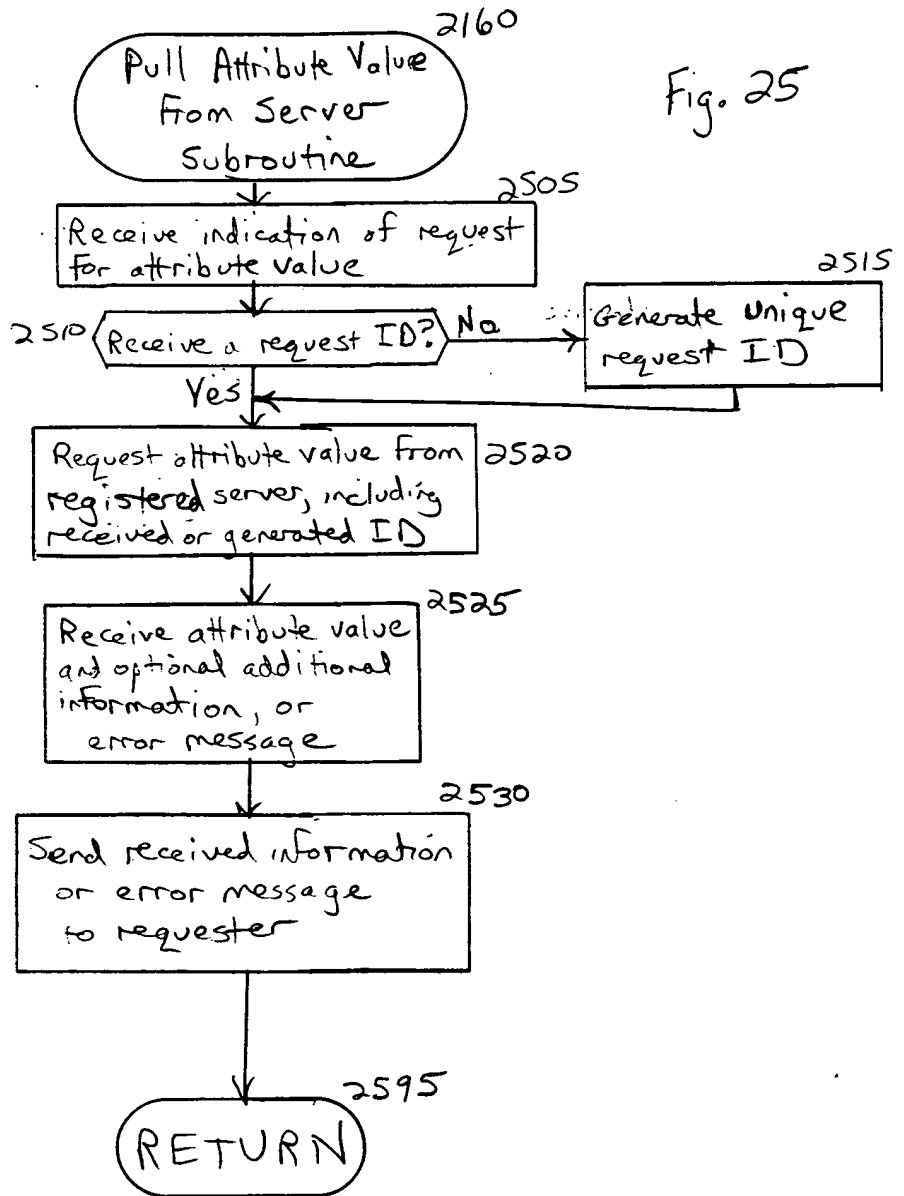
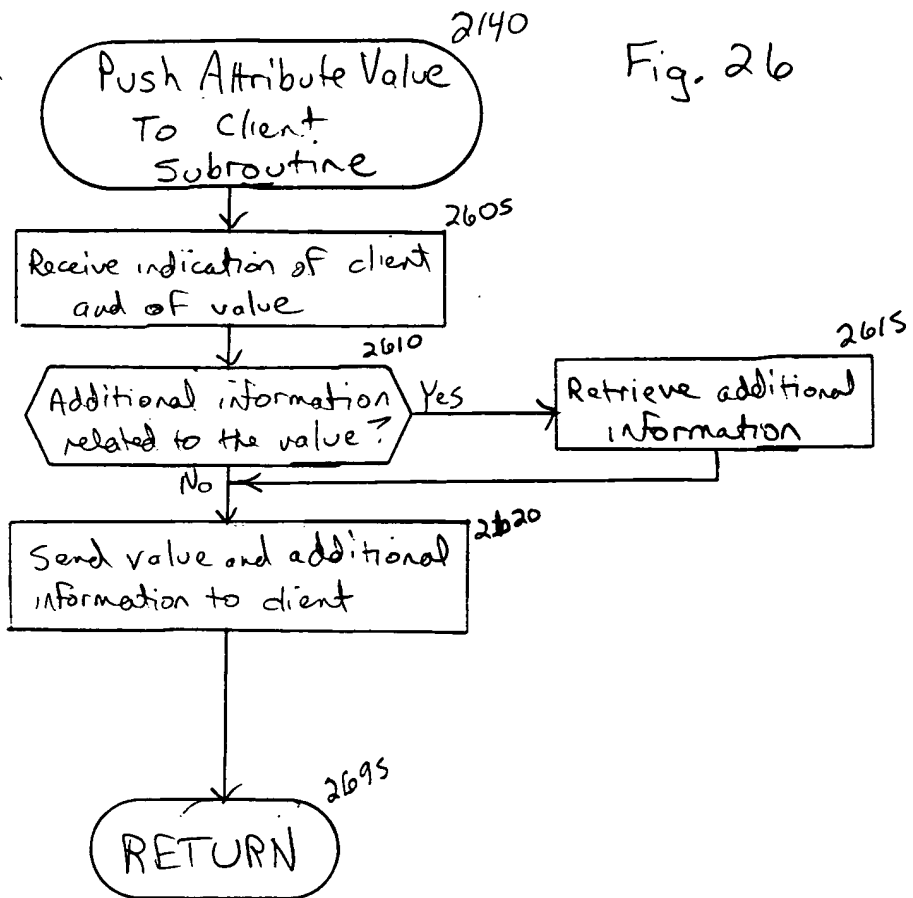


Fig. 24



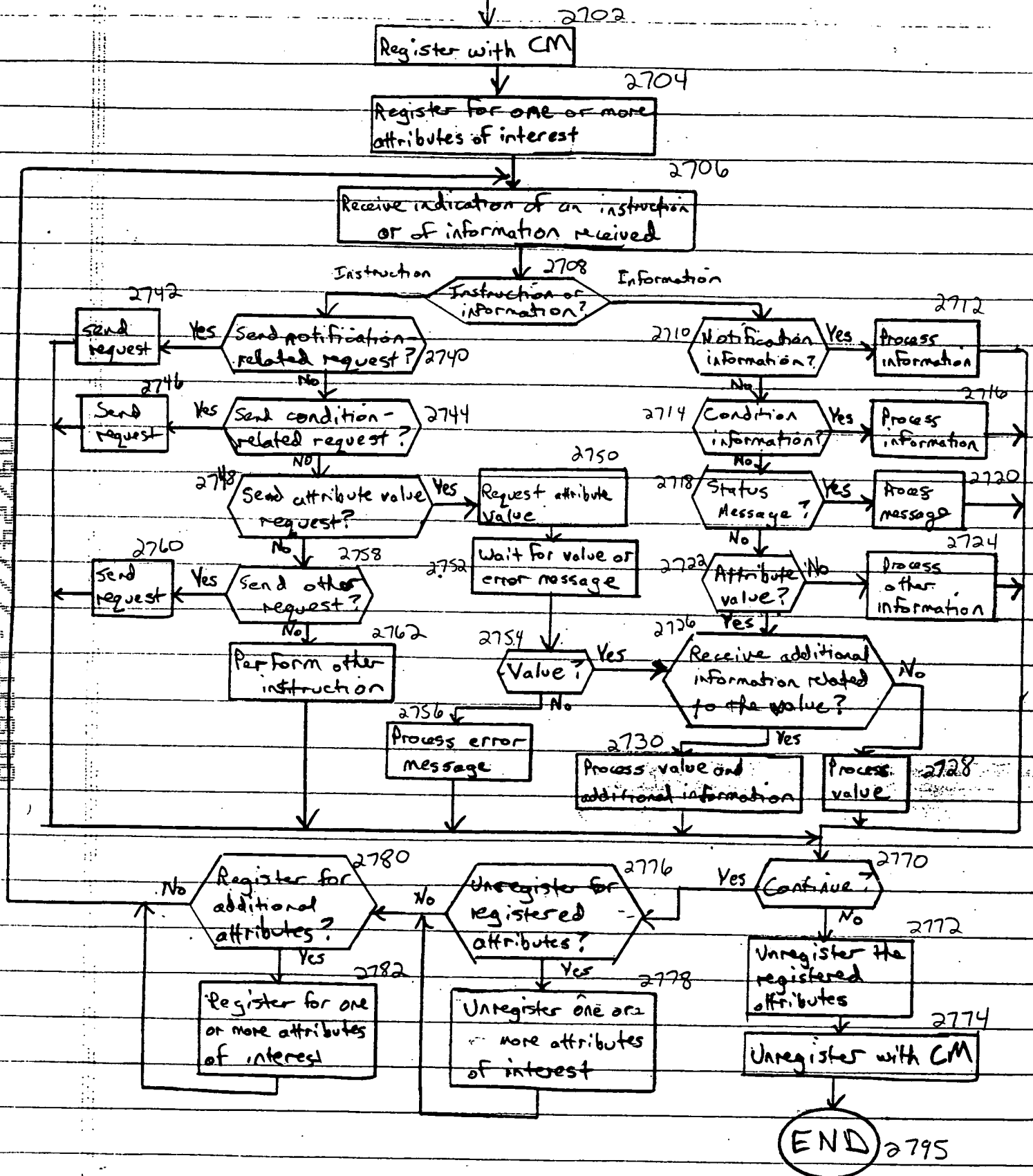
0972477 14800





Context Client Routine 2700

Fig. 27



Context Server Routine 2800

Fig. 28

Register with CM 2802

Register for one or more attributes to supply 2804

Receive indication of an instruction or of information received 2806

Instruction Information 2808

Instruction or information?

2812

Send request

2810

Send notification-related request?

Yes

2816

Send request

Yes

2814

Send condition-related request?

Yes

2820

Send request

Yes

2822

Perform other instruction

Yes

2828

Send other request?

Yes

2830

Notification information?

Yes

2832

Process information

Yes

2834

Condition information?

Yes

2836

Process information

Yes

2838

Status Message?

Yes

2840

Process message

2852

ID match?

Yes

2854

Determine input information needed

Yes

2856

Attribute value?

Yes

2858

Store attribute & ID

Yes

2860

Request attribute value with ID

Yes

2862

Wait for value or error message

Yes

2864

More?

Yes

2866

Remove attribute & ID

Yes

2868

Any errors?

Yes

2870

Sensor value?

Yes

2872

Request sensor value

Yes

2874

Wait for value or error message

Yes

2876

More?

Yes

2878

Any errors?

Yes

2880

Sensor information?

Yes

2882

Process other information

Yes

2884

Can calculate an attribute value?

Yes

2886

Store sensor information

Yes

2888

Generate additional information about calculated value

Yes

2890

Send value and additional information to CM

Yes

2892

Unregister the registered attributes

Yes

2894

Unregister one or more attributes being supplied

Yes

2896

Register for additional attributes?

Yes

2898

Register for one or more attributes to supply

Yes

2899

Unregister with CM

Yes

2900

END